CHAPTER 1

INTRODUCTION

1.1 Background Study

Nowadays Malaysia has become one of the leading countries in developing. This also makes the construction industry in Malaysia become a demand and continue to growth rapidly. On Thursday September 10th Malaysia government has announced about a plan to transform the construction industry by 2020 called Construction Industry Transformation Programme (CITP). The plan aims to improve the sector in a range of areas, including safety and professionalism, quality, environmental sustainability, and productivity and internationalization.

In construction industry, brick is an important material especially in Malaysia. In Malaysia bricks have been used widely to construct a wall rather than concrete. This is because brick is certainly cheaper than the normal concrete. Bricks also lighter than concrete which enable to reduce the dead load of entire structure which resulting in an economical design for a structure. In addition bricks have more flexibility which makes it easier to alter rather than concrete.

In manufacturing bricks, river sand is one of the important raw materials aside from cement or clay. River sand also plays an important role in many constructions area which make it become a high demand material. This leads to overexploitation of the river which resulting in a large scale depletion of this source and also environmental pollution. Sand is a non-renewable source which means it cannot be produce by the nature and leads to the higher shortage of the sand. As the demand of the sand increase the price also become increase.

Utilization of industry by products is one of the ways to help in reducing the using of natural sources. Furthermore most of the industry by products produces pollution to the environment which can affect the environment and mostly to human health. Utilization of industry by products has become popular in construction field especially in manufacturing materials. Besides that by utilizing the industry by products it also can help to overcome the problem of disposal it. Quarry dust from quarry plant is one of the by products that can be used to replace sand in manufacturing bricks.

Quarry plant is a place where it is designed to reduce the size of the large rock into smaller rock or gravel. Besides that, it also produces a waste product call quarry dust. Quarry dust is one of the major source of air pollution although it is apparently depends on several factor such the microclimate conditions and the concentration of dust particles in the ambient air. In addition quarry dust also has chemical properties which is not good for human body to inhale the air that contains quarry dust. For example limestone quarries produce highly alkaline (and reactive) dusts, whereas coal mines produce acidic dust.

An issue arising out of these activities plays a vital role in the search for innovative, environmentally friendly and ready-to-use building composites that combine higher efficiency and quality in the building process with improved thermal resistance (Sivagnanaprakash, Murthi, & Sekaran, 2016).

In this research, it is about the study of replacing sand in bricks with quarry dust. This study will carry out with an experimental study to know about the mechanical properties of the bricks.

1.2 Problem Statement

The issue on quality, environment preservation and sustainability has leads to the research of utilizing waste materials to be used again to create new products. In construction, the price of the sand becomes higher as the demand of the sand increase. The exploitation of the river with the sand mining activity also leads to the disturbed of ecosystem in the river. Quarry dust is a by-products form from quarry industry which is a useless material and become a problem of disposal it. In advance by taking quarry dust as a material in bricks can become as an alternative measure to reduce the demand of the sand in bricks manufacturing and enhanced to maintain the ecosystem and the environment.

1.3 Objectives

i. To determine the optimum ratio of quarry dust in cement sand brick.

ii. To determine the characteristic of cement sand brick in term of compressive strength, flexural strength and water absorption.

1.4 Scope of Study

Quarry dust that has been used in this study was taken from Kuari Bukit Bekelah, Gambang, Pahang. This raw material that replace river sand will be experimental as composite in making brick sample with ratio of 1:5 for cement and sand. The water curing of the cement brick will go through 7 days, 14 days and 28 days.

The testing of the cement brick consists of compressive strength, flexural strength and water absorption test. The percentage that been used in this study are 10%, 20% and 30%. Compressive strength and flexural strength test will be done at ages of 7 days, 14 days and 28 days of curing while water absorption test will be done at 28 days of water curing.